

Abstract

A shift converter, or reactor, (16HT, 16LT) in a fuel processing subsystem (14, 16HT, 16LT, 18), as for a fuel cell (12), uses an improved catalyst bed (34, 50) and the addition of oxygen (40, 40A, 40B, 40C, 40D, 41A, 41B, 41C, 41D) to reduce the amount of carbon monoxide in a process gas stream. The catalyst of bed (34, 50) is a metal, preferably a noble metal, having a promoted support of metal oxide, preferably ceria and/or zirconia. A water gas shift reaction converts carbon monoxide to carbon dioxide. The oxygen may be introduced as air, and causes an improvement in carbon monoxide removal. Use of the added oxygen enables the shift reactor (16HT, 16LT) and its catalyst bed (34, 50) to be relatively more compact for performing a given level of carbon monoxide conversion. The catalyst bed (34, 50) obviates the requirement for prior reducing of catalysts, and minimizes the need to protect the catalyst from oxygen during operation and/or shutdown.